

We claim:

1. A purified and isolated nucleic acid sequence encoding all or a portion of an organic anion transport protein ("OATP"), said OATP comprising an amino acid sequence selected from the group consisting of SEQ ID NO:2 (OATP2), SEQ ID NO:4 (OATP-RP2), SEQ ID NO:6 (OATP-RP3), SEQ ID NO:8 (OATP-RP4), SEQ ID NO:10 (OATP-RP5), and SEQ ID NO:12 (OATP-RP1).
2. The nucleic acid sequence of claim 1 comprising (a) a nucleic acid sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:3, SEQ ID NO:5, SEQ ID NO:7, SEQ ID NO:9, and SEQ ID NO:11; (b) the coding region of (a); (c) the complement of (a) or (b); or (d) nucleic acid sequences that differ from (a), (b) or (c) due to degeneracy of the genetic code.
3. An expression vector comprising a nucleic acid molecule as claimed in claim 1 or 2 and an expression control sequence operatively linked to the nucleic acid molecule.
4. A transformant host cell including an expression vector comprising a nucleic acid molecule as claimed in claim 1 or 2 and an expression control sequence operatively linked to the nucleic acid molecule.
5. An OATP protein comprising the amino acid sequence selected from the group consisting of SEQ ID NO:2 (OATP2), SEQ ID NO:4 (OATP-RP2), SEQ ID NO:6 (OATP-RP3), SEQ ID NO:8 (OATP-RP4), SEQ ID NO:10 (OATP-RP5), and SEQ ID NO:12 (OATP-RP1).
6. A modified OATP protein comprising an OATP of claim 5 that maintains an activity of said OATP protein of claim 5, wherein said modified OATP protein comprises at least one amino acid substitution or deletion.
7. A method of producing OATP, said method comprising the steps of:

a) inserting a nucleic acid sequence according to claim 1 or 2 encoding said OATP protein, or a homologue thereof, into an appropriate expression vector,

5 b) transfecting said expression vector into an appropriate transfection host cell,

c) growing said transfected host cells in an appropriate culture media, and

d) purifying the OATP protein, or a homologue thereof, from said culture media.

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8. An isolated nucleic acid sequence which hybridizes under stringent conditions to the nucleic acid sequence of claim 1 or 2, wherein said nucleic acid sequence contains at least 18 contiguous nucleotides from SEQ ID NO:1, SEQ ID NO:3, SEQ ID NO:5, SEQ ID NO:7, SEQ ID NO:9 or SEQ ID NO:11.

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9. An antibody specific for the OATP as claimed in claim 5.

10. The antibody of claim 9 wherein said antibody is a monoclonal antibody.

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11. The OATP of claim 5, produced by:

a) inserting a nucleic acid sequence encoding said OATP into an appropriate expression vector,

25 b) transfecting said expression vector into an appropriate transfection host cell,

c) growing said transfected host cells in an appropriate culture media, and

d) purifying the OATP from said culture media.

30 12. A method for identifying a ligand which is capable of binding to the OATP of claim 5, or to a part of said OATP, said method comprising the steps of:

(a) reacting said OATP, or part of said OATP, with said ligand which potentially is capable of binding to the OATP or part of said OATP, under conditions which permit the formation of ligand-OATP complexes; and

(b) assaying for ligand-OATP complexes, for free ligand, or for non-complexed OATP.

13. A method for identifying a substrate which is capable of being transported by the OATP of claim 5, or a part of said OATP, said method comprising the steps of:

(a) reacting said OATP, or part of said OATP, with said substrate which is potentially capable of being transported by the said OATP or part of said OATP, under conditions which permit the movement of said substrate across a membrane; and

(b) assaying for the movement of said substrate across the membrane.

14. A method of delivering a molecule to a an organ that expresses an OATP protein of claim 5, said method comprising:

(a) identifying a substrate that is transported by said OATP;

(b) joining said substrate to said molecule to be delivered to form a substrate-molecule fusion compound; and

(c) providing said substrate-molecule fusion compound to said organ.

15. A fusion protein comprising all or a portion of the OATP of claim 5, attached to a second polypeptide.

16. A method for identifying a modulator which is capable of augmenting or inhibiting the transport of a substrate by the OATP of claim 5, or a part of said OATP, said method comprising:

a) reacting said OATP, or part of said OATP, with said substrate and said modulator which potentially is capable of augmenting or inhibiting the transport of a substrate under conditions which permit the movement of said substrate across a membrane;

- b) measuring the augmentation or inhibition of transport of said compound by said modulator.

17. A nucleic acid molecule of claim 2, wherein said nucleic acid molecule
5 comprises the OATP gene, or a complement of the OATP gene, contained in ATCC
Accession Number 207209.

18. A nucleic acid molecule of claim 2, wherein said nucleic acid molecule
comprises the OATP gene, or a complement of the OATP gene, contained in ATCC
10 Accession Number 207210.

19. A nucleic acid molecule of claim 2, wherein said nucleic acid molecule
comprises the OATP gene, or a complement of the OATP gene, contained in ATCC
Accession Number 207211.

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20. A nucleic acid molecule of claim 2, wherein said nucleic acid molecule
comprises the OATP gene, or a complement of the OATP gene, contained in ATCC
Accession Number 207212.

20 21. A nucleic acid molecule of claim 2, wherein said nucleic acid molecule
comprises the OATP gene, or a complement of the OATP gene, contained in ATCC
Accession Number 207213.

22. A nucleic acid molecule of claim 2, wherein said nucleic acid molecule
25 comprises the OATP gene, or a complement of the OATP gene, contained in ATCC
Accession Number 207214.